

Second Symposium Deemed a Success

On 12–14 January 1998, the NIEHS sponsored the second of a series of science review symposia to discuss and evaluate research findings related to exposures to extremely low frequency electric and magnetic fields (ELF-EMFs). At the symposium, held in San Antonio, Texas, over 100 scientists including epidemiologists, physicists, biologists, engineers, statisticians, and toxicologists met in sessions to evaluate the quality and reproducibility of current epidemiological findings, and to consider whether—and how strongly—these findings either support or refute potential health effects associated with ELF-EMF exposures. The NIEHS designed the symposium series to foster open debate and communication about the scientific data among the participants. “This symposium provided us with critical insight into the strengths and weaknesses of the various epidemiological studies we must evaluate under this program,” says Christopher J. Portier, chief of the NIEHS Laboratory of Computational Biology and Risk Analysis and director of the hazard evaluation project for the Electric and Magnetic Fields Research and Public Information Dissemination (EMFRAPID) Program. The findings of the symposia will serve as the basis for an upcoming report to Congress that the NIEHS will submit by the end of this year.

Much of the concern about ELF-EMF exposure is related to 60-Hertz (Hz) fields that are produced by the generation, transmission, and use of electric energy. These fields are a fact of daily life—they are associated with power lines, transformers, service wires, electrical panels, home appliances, and plumbing lines. Electric fields and magnetic fields each have unique properties and may thus affect biological systems in different ways, so there is considerable debate over what health effects may result from such exposures. Some individuals believe that evidence points to health problems such as leukemia, spontaneous abortion, and neurobiological disorders being caused by ELF-EMFs, but this has yet to be determined. Laboratory studies are providing clues about how ELF-EMFs may interact with basic biological processes; however, overall effects attributable to them have been small and difficult to reproduce. Research projects in whole animals have also been carried out to examine a large variety of possible effects of ELF-EMF exposure that might be relevant to human



health. A caveat to such work is that the animals might not exhibit the same response or sensitivity to exposure as human beings.

The EMFRAPID Program was established by Congress in the 1992 Energy Policy Act. The five-year effort is funded jointly by federal and matching private funds, and is dually administered by the NIEHS and the Department of Energy. The goal of this program is to answer the question of whether exposure to 60-Hz EMFs—especially those associated with generation, transmission, and use of electric energy—adversely affects biological systems and, if so, to what extent. The program serves a dual purpose: to evaluate developing technologies and promote research on the effects on human health of ELF-EMF exposure, and disseminate the results of such research to the public sector. Epidemiologic studies conducted over the past two decades have raised interesting but unsubstantiated theories about the link between certain human health effects and exposure to ELF-EMFs. The EMFRAPID Program seeks to delineate not only whatever links may exist between exposures and health effects, but also any special conditions under which cause–effect relationships might occur.

Portier notes that the area of ELF-EMF epidemiology is hotly controversial; the ability to bring not only the ELF-EMF researchers themselves but also scientists from outside the debate into a detailed discussion of the quality and strength of these studies will help to clarify the results. In judging the quality of the arguments presented at the symposium, Portier says, “The openness and diligence of the attendees was superb and we truly could not have covered this material without their aid.”

This is especially good news, given that open discussion on ELF-EMF data has often focused on the lack of follow-up funding and support allotted to the EMFRAPID Program. In an address to the symposium, Shirley D. Linde, chair of the National EMF Advisory Committee, which advises the coordinating agencies on the design and implementation of the program, decried the obstacles faced by scientists as they attempt to answer the many questions surrounding ELF-EMF

exposure: underfunding, what is seen by some as political meddling in an area best left to scientists, and public pressure created by the media by publicizing research findings out of context. “An implicit assumption is that research is unbiased and the interpretation of the results is without political influence. I used to believe this, but I’ve since learned differently,” said Linde in her address.

Nevertheless, with its San Antonio symposium, the NIEHS successfully created what Mary Wolfe, associate director for the EMFRAPID hazard evaluation project, calls an atmosphere of collegial exchange among attendees. Plenary sessions opened the door for breakout group sessions concentrating on the experimental findings for particular areas. The breakout sessions focused on five disease areas: childhood cancers, breast cancer, other adult cancers, adverse reproductive outcomes, and neurodegenerative diseases/neurobiological disorders. The discussions generated by each breakout group were recorded and will be published in a bound report that is anticipated to be available after 30 March 1998. Other sessions looked at specific methodologic issues related to ELF-EMF epidemiological data, including methodology for data analysis, exposure assessment, and the use of mechanistic data in strengthening the research findings.

The fact that there are still so many unanswered questions about the health effects of ELF-EMF exposure continues to ignite controversy over the issue, and the meeting bore this out. Wolfe feels that people who arrived with a firm, fixed position generally did not budge in their views. However, she says, “a large number of scientists were able to question the arguments of those scientists with a firm view. The reports should give us a good description of why certain views are held and how the remaining members of the breakout group viewed the arguments.” However, because the symposium was designed purely as a forum for discussing, no consensus statement was either sought or issued.

A third symposium, planned for 6–9 April 1998 in Phoenix, Arizona, will focus on clinical and *in vivo* laboratory findings. This symposium, like the others in the series, will be open to all interested public, scientists, and stakeholders. In addition, the NIEHS EMFRAPID Program home page at www.niehs.nih.gov/emfrapid/home.htm provides regularly updated information on the program’s projects and findings, as well as previously published reports.

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